Pacific Packet Radio Society Newsletter
August 1988

PPRS Meeting announcement:

The speaker for the August 2 meeting will be announced at the meeting. It will *NOT* be a speaker on TCP/IP. PPRS meets the first Tuesday of the month at 7:30 pm at the Ampex Cafeteria, 411 Broadway, Redwood City. Enjoy another rousing night of 'cuss and discussion about current topics in packet radio. Current leadership: Glenn, AA6ER, President. Dewayne, WA8DZP, Vice President. Bill, WA6FSP, Treasurer. Chris, N6RAL, Secretary. Mike, KI6AP, Newsletter.

Your membership expiration date is now shown on your newsletter address label. You should consider renewing your membership if you are enjoying PPRS. Please update any incorrect information.

PK-232 DCD problem:

From: N7CL @ W1FJI

Recently, several new packeteers using PK-232s appeared on our local duplex repeater. This is one environment where the collision frequency should be low since there are no hidden terminals. We soon noticed that the collision frequency had risen dramatically. After some investigation we discovered certain stations were usually involved in stepping on in-progress packets. These stations were contacted and in all but 1 case they were new users of PK-232s.

We were puzzled as there have always been stations on the repeater using PK-232s with no apparent problems. The new stations were asked how their station was configured and what method was used to get the DCD operation adjusted. We were surprised at the answers we got. Each of the offending stations had set their station up exactly according to the instructions in the PK-232 manual. However, none of these stations had configured their setup so that they could hear what was going on on the channel when the PK-232 was connected to the radio. None of these new operators knew what DCD meant, what it did, or why it was important that it should be working on a multiple access packet channel.

We obtained a PK-232 and a manual to try and discover the exact nature of the problem. What we found was that although the manual is very complete and generally very well written, there are some areas where it leaves something to be desired. Specifically, in this case, the instructions given on page 2-16 (we had manual PK232UG Rev. B 9/86 for reference) for setting up the PK-232 and an FM radio for DCD operation are simply incorrect. If set up exactly as described, DCD will NEVER be asserted during a packet transmission by another station on the channel!! We had found the cause of our problem.

If you have a PK-232 and haven't already discovered this problem for yourself, please disregard the instructions in the manual for setting up a PK-232 and NBFM radio for 1200 baud packet operation and use the method presented here. All your packet neighbors will appreciate it very much.

The manual is quite correct in all respects EXCEPT where they discuss setting the DCD THRESHOLD control and receiver audio output level for proper demodulation and DCD circuit operation. The correct way to set these adjustments is as follows:

1. Arrange to be able to hear the receiver audio signal which is being sent to the PK-232.
2. Set the squelch circuit on the radio for normal squelched operation. The DCD circuit in the PK-232 is incapable of proper operation with unsquelched audio from the receiver.
3. While monitoring incoming packets, adjust the receiver audio level so that the tuning indicator "spreads" fully when receiving a packet from the station on the channel which produces the LEAST amount of audio output level. There are several limiters in the PK-232 demodulator so louder stations will not be affected adversely by this.
4. Once the audio level is properly set, adjust the DCD THRESHOLD control on the PK-232 so that the DCD led lights when there is a packet being transmitted by the station on channel which produces the LEAST amount of audio output from the receiver. Make sure, however, that the DCD LED is extinguished when there is no signal and the radio's squelch circuit has cut off all audio from the receiver.

If the above procedure is followed, the PK-232 will properly hold off transmitting during a packet transmission from another station and will not send acknowledgements to individual frames of a maxframe greater than 1 packet while it is still being transmitted.

We hope PK-232 owners will find this information useful and take steps to assure that their DCD is operating properly. Multiple access packet channel throughput is severely degraded when DCD is not working.

73 and happy packeting, Eric Gustafson N7CL

Need PK-232 Terminal Program

From: N7BFG @ N7BFG

Hi, I am looking for a good terminal program to use with a PK-232 and a TRS-80 Model 4P. It can run under TRSDOS 6.2, 1.3 or Montezuma Micro CP/M 2.2. I have searched through Compuserve but have not found what I am looking for. I would like split screen, type ahead buffer (500 bytes?), file save and transfer, and ability to have real time printout. I plan on using this for rtty only on both vhf and hf.

Any suggestions are highly appreciated.... de Tim N7BFG @ N7BFG

Digicom v2.1 Update

KF6PU @ WB6YMH

To update Digicom v2.00 to Digicom v2.1 which has improved printer and perm file writing routines load and run Digicom v2.00 . While in the command mode type in each of the following mem statements. Hit the return key after each statement.

```
MEM $7338 20 5D 3C 90 05 A2 00 CA
MEM $7340 D0 FD 60 24 3F 30 10 A5
MEM $7348 86 C9 04 F0 0A 24 82 30
MEM $7350 03 4C 86 3A 4C BD 3A 20
MEM $7358 7E 2D 20 39 3C 24 82 10
MEM $7360 0A 20 5D 3C 90 FB 20 5D
MEM $7368 3C B0 FB 20 5D 3C 90 FB
MEM $7370 20 42 3C 4C D0 3A
MEM $3A82 4C 43 73 EA
MEM $3AB3 20 38 73
MEM $3B89 30
```

After having entered the new mem statements to update Digicom you will still be in the command mode as evidenced by the colon in column one. Now type the word basic and hit the return key. This will exit you from Digicom. While in basic do the following:

1) Type 10 sys (2064) and hit the return key. Don't forget the parentheses.
2) Type poke 45,0:poke 46,120 and hit the return key.
3) Type save"digicom v2.1",8 and hit the return key

That is all there is to it. You will find that the updated version now works with the Commodore 801and many other printers . Set the prntrset command to 7 0 (not 70). With the Okidata 180 and some other printers it may be necessary to disconnect the SQRIN line on the serial bus or at least turn off the disk drive when using the printer.

You will also notice that the perming bug has been fixed. No longer is there the occasional problem of writing a new perm file only to have the old one scratched and the new one never written to disk correctly.

If you have any questions please contact Mike KF6PU @ WB6YMH-2 or Barry W2UP @ KB3UD.

MFJ 1270 vs C-128

WA6UZR @ WA6NWE

I AM HAVING PROBLEMS GETTING A MFJ 1270 TO WORK ON A COMMODORE 128. CONNECTIONS SEEM CORRECT BUT NOTHING COMES ON SCREEN. ANYONE HAVE ANY PROBLEMS GETTING THEIR 128 TO WORK WITH 1270 PLEASE LET ME KNOW. ART WA6UZR @ WA6NWE 73'S

7th ARRL Network Conference

From: W3IWI @ W3IWI

The 7th Annual ARRL Networking Conference will be held on Saturday, October First at the Johns Hopkins University Applied Physics Laboratory (APL) Kossiakoff Center. The APL facility is located between Laurel and Columbia MD, midway between Washington and Baltimore.

The networking conference will bring together the developers of hardware and software for amateur computer networks and the users. In the past the conference has been the forum for the announcement of many exciting new developments and the published conference proceedings have become valuable reference documents. This year it is anticipated that contributions will include information on new networking software, new modem technology, digital signal processing and the new series of PACSAT satellites which AMSAT-NA plans to launch beginning in early 1989.

Prospective contributors should obtain an author's kit direct from ARRL. The deadline for the submission of camera-ready manuscripts is August 25th.

If you plan to attend the conference, we ask that you register early. A registration fee of $20 will provide a copy of the conference proceedings, buffet luncheon and defray the costs of putting on the meeting. If your registration is received after Sept. 25, the fee will be $30.

Your registration should be sent directly to:

Don Bennett, K4NGC
P.O. Box 1944
Woodbridge, VA 22193

Make your checks payable to Don Bennett. Registrants will be sent a list of hotels/motels in the area, maps, etc. Sponsors of the conference include the ARRL, APL ARC, AMSAT, TAPR, AMRAD and VPRA. 73 for the local organizing group de W3IWI

Network Emergency Communications

From: WD5B @

I am interested in developing some form of emergency communications procedures within the network and would appreciate hearing from you concerning what our role could, or should be.

Everyone of us has some sort of possible disaster looming. Among other things, California and Arkansas have a very high risk of earthquakes, Arkansas has tornado, Mississippi/Texas have tornados and hurricanes, and the list goes on. If for not other reason than our state, we actually have a better chance of a major earthquake along the New Madrid fault than California and predictions show an extremely good chance that there will be NO communications other than amateur radio for up to and past three years from the time of the disaster.

We have a mode of communications here that could be a vital part of any long term communications requirements. I have not seen any communiques on this system concerning its use during emergency conditions of one of its members and believe it is time it should be looked at. If you could help me I would appreciate it. It would be very useful if each member could pass along information about his station, local coverage to disaster offices and especially local EC's who are on, or can be reached, by packet.

Please forward any information you can provide. I look forward to any comments, suggestions or proposals you might have on this subject. Regards, Rich/WD5B

56kbps RF modem available

From: ke3z via Gateway

The WA4DSY RF modem is available as a kit from GRAPES (PO Box 871, Alpharetta, GA, 30239-0871). A full kit (except for frequency xtals) is $250, a board/prom set for $110, or docs only for $20. Any takers?

Macintosh Packet Radio Database

From: kd5vu via Gateway

A Works doc or Hypercard stack of Macintosh packeteers is available by sending SASE mailer with formatted floppy to kd5vu or n6phj. To add your Mac station to the database send the details to n6phj @ n6iiu. The database is also available in the FreeSoft library on GEnie.

C programmers unite

N7KZG @ KE7OM

Here is the current list of folks interested in the C net:

Mark R. Holbrook - n7kzg	C on Xenix	n7kzg @ ke7om
Steve - n7hfz	Interest	n7hfz @ n7hfz
Curtis - n6ect	Interest	n6ect @ w6pw-3
Al Dynarski - wa6syk	Interest	wa6syk @ w6cus
Jeff - ko7m	Programmer	ko7m @ ke7om

Any others interested? Send a message to Mark.

Antennas

AB9B @ W6PW

The J-Pole seems to be a fad antenna in this area. I've recently heard a lot of ridiculous claims for it - ie - gain figures of 3 to 7 dB over a quarter wave, easy to build, etc. It sure is popular, and I sure don't know why. I'd like to dispel these claims, and present a few alternatives for simple, effective 2-meter homebrewed antennas.

The J-Pole isn't a magic antenna - it's simply an end-fed half-wave. It's inherent gain, versus a 1/2 wave dipole is theoretically 0 dB - the same, assuming that the J-Pole is tuned perfectly. In fact, the dipole might offer slightly better performance, since it doesn't have the loss of the matching stub included in its design. The J-pole, and its cousin the 1/2 wave dipole, do exhibit some small amount of gain over a quarter-wave vertical, primarily due to a slightly lower angle of radiation.

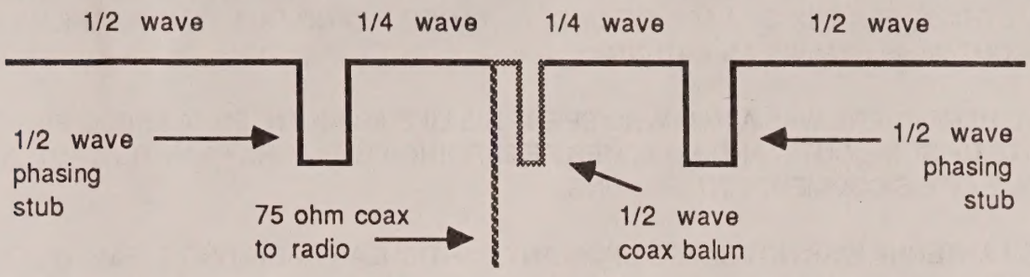
The decoupling/matching stub at the bottom of the half-wave section of the J-Pole doesn't impart any magic properties - it just provides coupling between the unbalanced low-impedance coax feed and the high-impedance found when looking into the end of a half-wave radiator. It (theoretically) doesn't even radiate. It definitely doesn't provide any gain.

The J-Pole is a tricky little antenna to tune. The location of the connection point on the stub will vary widely with the construction used. Performance falls off rapidly with mistuning - either the length of the half-wave radiator (in series with the quarter-wave stub) or the attachment point of the coax. You really ought to use an SWR bridge for tune up, finding both the optimum length for the radiator and the attachment point for the coax.

For the same gain as a half-wave dipole, why fool around with all the tuning? A vertical dipole is simplicity itself. Find a stick, some wire, and a hunk of coax. Cut each leg of the dipole to about 19.5 inches, tape it to the stick, and solder your coax dipole fashion. Mount the antenna vertically, and try to lead the coax away as nearly perpendicular as you can for at least six feet. (This isn't critical - just don't run your coax right down the stick.) Plug the coax into your radio and communicate! Dipoles are fairly broadband antennas, allowing you to get by safely without an SWR bridge. Performance of an antenna built as I've described will be slightly better than a quarter-wave vertical, and will equal or exceed well-tuned J-Pole. (If it's important to you, the dipole will be about 16" shorter, too.) This is the antenna to toss together quickly when you get a new rig, and just can't wait to put it on the air. For packet and repeater work near metropolitan areas, it may be all the antenna you'll ever need.

If you need more gain than provided by a vertical dipole, you might try the antenna that Jim, W9TO (designer of the Hallicrafters TO keyer) swore by - a 3/4 wave decoupled vertical. This antenna is built like a dipole, except that one leg is 1/4 wave, and the other 3/4 wave. (The 3/4 wave section points up.) The dimensions would be about 19.5" for the quarter-wave section, and 58.5" for the 3/4 wave section. Solder the coax, dipole fashion, between these elements, with the center conductor connected to the 3/4 wave section. Tape the assembly to a stick or piece of PVC pipe, lead the coax away perpendicularly (or nearly so) and you're on the air. I estimate that the gain of this antenna would be a bit better than 2 dB over a half-wave dipole, with a lower angle of radiation. One possible problem - the driving impedance is probably higher than that of the halfwave dipole, so the SWR might be a bit high if you're using coax feed line.

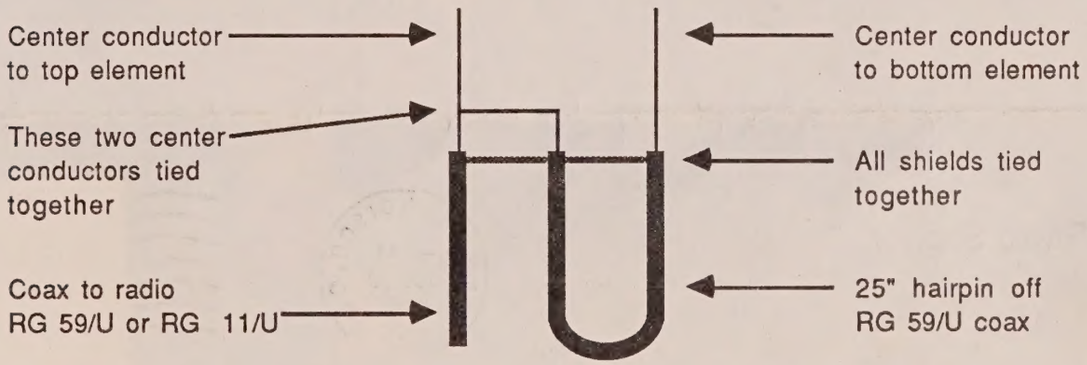
Now to my favorite VHF base omnidirectional antenna - the 3-element collinear vertical. (This is the one I have used - and do use. I like it!) This antenna is also known as a "three half-waves in phase" vertical, which describes its operation better.



3 Element Collinear Vertical

I built my original version on a bamboo fishing pole, and my latest on 3/4" PVC pipe. Either seems to work, although the pipe flexes quite a bit more than the fish pole did. I used 14-ga. copper wire for this antenna, and 12 ga. copper for my previous one. The 1/4 wave sections are 19" long, and the 1/2 wave sections are 38" long. The phasing stubs come out perpendicularly from the mast 18-1/2 inches, with 1" spacing between the conductors of each stub. (I leave the stubs self-supported. You might wish to get fancy and support yours, but 12-ga stubs survived a couple of Chicago winters.) If you wish to experiment, you might try a different stub configuration. I've tried both coax coiled around the mast and looping the open wire stubs around like the matching ring on a Ringo Ranger. I had no luck with either, but I know that there must be a better mechanical way than hanging them straight out from the mast as shown above.

The ARRL Antenna Book says that the feed point impedance of this antenna is about 300 ohms balanced, so you'll have to build a 4:1 balun if you feeding your antenna with coax. You can use a 1/2 wave section (25" length) of RG59/U as the balun:


Center conductor to top element
These two center conductors tied together
Coax to radio RG 59/U or RG 11/U
Center conductor to bottom element
All shields tied together
25" hairpin off RG 59/U coax

4:1 2 meter balun

As with the other antennas I've described, lead the coax away as perpendicularly as possible for at least six feet. One nice thing about collinears is that they aren't particularly critical about tuning. For my first one, I used a grid-dip meter to tune it up carefully. For the one I'm currently using, I just measured, soldered, and taped the result to the PVC pipe. From what I can determine, there's no difference in performance between the two versions.

This antenna gives you quite a bit of gain for omnidirectional work. When you care enough to put something like this up (or the commercial equivalent), be kind to your station - use low-loss coax such as RG11/U if you will be using any appreciable length of feed line.

The ARRL Antenna Book states that the gain of this antenna is 3.2 dB over a dipole, and somewhat more than this over a quarter-wave vertical. However, it seems to have an very low angle of radiation, showing usable performance which exceeds its nominal gain rating. On-the-air testing shows that this antenna more than holds its own against Ringo Rangers and the like. For an omnidirectional antenna, this is a strong performer.

I hope that you've seen that there are some alternatives to the J-Pole, and that you don't have to put out big bucks for store bought antennas to put your radio on the air. Good Luck! If you have any questions or comments (let's hear it from those J-Pole fans!) leave me a note on W6PW-3. I'd especially like to compare results with others using the collinear. 73! de Tom AB9B @ W6PW-3

From: W6AOF @ N6IIU

HELLO TOM- I FOUND YOUR COMMENTS ABOUT J-POLES (WE USED TO CALL THEM J'S) RIGHT ON THE MONEY. THE INTEREST IN THEM, I THINK, IS A MIX OF LACK OF UNDERSTANDING, AND READY AVAILABILITY-- HOW MANY FM-ERS HAVE EVER CUT WIRE TO MAKE AN ANTENNA?

BACK IN THE '50'S AROUND HERE THERE WAS A HAM WHO SPENT HIS LIFE AS AN ANTENNA ENGINEER-- OLIVER WRIGHT, W6GD. HE WROTE UP SOME OUTSTANDING NOTES REGARDING VHF (MAINLY 2 METER) ANTENNAS. I THINK YOU MIGHT FIND SOME OF HIS COMMENTS INTERESTING.

1. HIS DESIGN OF THE J ANTENNA WAS NOT BASED UPON ANY PARTICULAR RADIATING-ELEMENT LENGTH-- YOU SIMPLY ADJUSTED THE MATCHING STUB DIMENSIONS TO GIVE A GOOD VSWR.

2. HE STRESSED, CORRECTLY, THE DESIRABILITY OF USING LOW-LOSS FEED LINE. HIS CHOICE WAS OPEN WIRE LINE (LADDER LINE).

3. ONE OF HIS FAVORITE RADIATING ELEMENTS WAS THE DOUBLE EXTENDED ZEPP, WHICH WAS A DIPOLE CONSISTING OF TWO 5/8 THS WAVELENGTH ELEMENTS. HE EVEN USED THESE AS THE DRIVEN ELEMENTS IN A SERIES OF YAGI DESIGNS THAT WERE POPULAR IN THOSE DAYS.

4. WHEN USING MULTI-ELEMENT ARRAYS, SUCH AS YOUR CO-LINEARS, FEED THEM IN PARALLEL-- SERIES FEED INVITES A WORLD OF UNEXPECTED PROBLEMS.

MY OWN COMMENTS: DON'T EVER, EVER, DRIVE A BALANCED ANTENNA WITH COAX WITHOUT A BALUN. DRESS THE FEED LINE PERPENDICULAR TO THE RADIATING ELEMENT AS FAR AS POSSIBLE-- SIX FEET AT 2 METERS IS NOT NEARLY FAR ENOUGH. 73, GEORGE, W6AOF @ N6IIU-1

Pacific Packet Radio Society
P.O. Box 51562
Palo Alto, CA 94303

Exp: DEC 31 88
Henry S Magnuski KA6M 12
2019 Barbara Drive
Palo Alto, CA 94303-3444